ticity of materials, the theory of springs, safety and dangers in structures and the testing of structures, on units, on dimensional equations, on absolute motion, on fatigue of materials are less well known, but students who read them will get a clear insight into subjects on which text-book reasoning is sometimes rather slipshod. His paper on the parallel roads of Lochaber is acknowledged to have cleared up a great geological puzzle. His paper on prismatic structure in basaltic rocks cleared up the Giant's Causeway puzzle.

In his paper of 1872 on atmospheric refraction of inclined rays and on the path of a level ray he solved another important problem. His integrating machine is now in use for tide-calculation. There are many papers on subjects of general interest to which I cannot refer because I have no space. Suffice it to say that on every subject about which he wrote he threw a new light, he gave fresh ideas and he started students on new lines of thought. In reading one of his papers we instinctively feel sure that he has given long and careful consideration to the matter and has looked at it from many points of view; consequently he has exact and clear ideas, and he is able to state them in simple language, so that we at once accept his conclusions as correct.

JOHN PERRY.

TABLES OF THE WEIGHT OF AIR.

Tabellen der Luftgewichte γ_t^b, *der Druckäquivalente* β_t^b *und der Gravitation* g.
Tables des poids de l'air γ_t^b, *des equivalents barométriques* β_t^b *et de la gravité* g.
Tables of the Weight of Air γ_t^b, *of the Air-Pressure Equivalents* β_t^b *and of the Gravity* g. By Dr. S. Riefler. Pp. iv+101. (Berlin: Julius Springer, 1912.) Price 6 marks.

IN rough experiments, the density or the weight of the air may often be ignored; generally, however, it is allowed for with more or less completeness. But when it is desired, as in the author's work, to make a precise determination, so precise that the effect of moisture in reducing it, or carbonic acid gas in increasing it, must not be ignored, and when the local value of g has to be allowed for, then the investigator may find the calculation to be unduly tedious.

The author of these admirable tables has been brought face to face with the difficulty in connection with the disturbing effect of the density of the surrounding air on the period of the pendulum of the astronomical clock. For instance, the rate of such a pendulum is changed by 1/100 second per day, so he states, by a variation in weight of one milligram per litre in the air surrounding the pendulum. He has, therefore, calculated a series of tables, where they were not already in existence, whereby all the data required can be found with the maximum of directness and accuracy and the minimum of trouble. Every table has the formula on which it is based printed at the head, and a clear statement of the whole problem is printed in three parallel columns in German, French and English. In only one case is this departed from, where the names of the countries in which a large number of stations are situated for which g has been determined are printed in English only, "on account of the extended use of this language"—a compliment which an English paper should acknowledge.

The most important of the tables is calculated for every 10 mm. of barometric height from 380 to 680 mm., and then for every mm. up to 790 mm., and for every degree of temperature from -1° C. to $+36^\circ$ C. For all these conditions the weight of a litre of air free from CO_2, but both dry and half saturated with moisture, is calculated on the basis that at Paris the weight of dry air free from moisture and CO_2 is, under standard conditions, 1293·21 mg. Alongside the figure giving the weight is another, called by the author "the pressure equivalent of temperature," which shows the change in pressure in mm. of mercury due to a change of 1° C. in temperature. It is interesting to notice that this, in the case of half-saturated air at 760 mm., has a minimum value at about 17° C.

It would require more space than is available to discuss the tables fully. It is sufficient to say that the printing, the paper and the arrangement are all admirable, and that these tables should be found in every laboratory where exact work is done.

C. V. B.

ANTHROPOLOGY AND ARCHÆOLOGY.

(1) *The Annual of the British School at Athens.* No. xvii. Session 1910–11. Pp. liv+355+xxi plates. (London: Macmillan and Co., Ltd., 1912.) Price 25*s.* net.
(2) *The Cochin Tribes and Castes.* By L. K. Anantha K. Iyer. Vol. ii. Pp. xxiii+504. (Madras: Higginbotham and Co.; London: Luzac and Co., 1912.)
(3) *The Origin of Civilisation and the Primitive Condition of Man.* Mental and Social Condition of Savages. By the Right Hon. Lord Avebury. 7th edition. Pp. xxviii+454. (London: Longmans, Green and Co., 1912.) Price 7*s.* 6*d.* net.
(4) *Notes and Queries on Anthropology.* Edited

for the British Association for the Advancement of Science by Barbara Freire-Marreco and Prof J. L. Myres. 4th edition. Pp. xii + 288. (London: Royal Anthropological Institute, 1912.) Price 5*s*.

(5) *Rough Stone Monuments and their Builders.* By T. E. Peet. Pp. xii + 172. (London and New York: Harper and Bros., 1912.) Price 2*s*. 6*d*. net.

(1) THE last issue of the Annual of the British School at Athens opens with an interesting review of the working of this institution since its foundation in 1883, prepared by the honorary secretary, Mr. G. A. Macmillan. In spite of its limited resources, the school, which deserves more active support from archæologists and students of classical literature in this country, has done most valuable work in the excavation of historical sites, and in the preparation of monographs on the archæology and anthropology of Greece and the eastern Ægean area. In the present volume, besides reports on the topography of the Troad, Thebes, Phylakopi, Phokis, and other places, Mr. W. R. Halliday has made an important contribution to the study of comparative religion in his article entitled "Cenotaphs and Sacred Localities," in which he deals with the stratification of local beliefs. It is interesting to read a description of a Thracian Tholos tomb at Kirk Kilisse, written before the recent campaign which has directed public attention to this place. The number, as usual, is provided with a fine series of maps and illustrations.

(2) Mr. L. K. Anantha Krishna Iyer, in the new volume of his survey of the people of the Cochin State in south-western India, passes from a description of the degraded forest and menial tribes to the higher castes, with whom he is much more personally familiar. He begins with an elaborate account of the Brahman classes, which display remarkable differences in beliefs and customs as compared with their brethren in northern India, from whom they form a comparatively recent offshoot. Then come the Nayars, with their strange marriage regulations and their unique association with the Nambutiri Brahmans. Equally interesting are the Mohammedan Mappillas, a race subject to occasional outbreaks of savage fanaticism which has from time to time nerved them to resist British troops. We have a full account of the remarkable colony of White and Black Jews, whose origin and history are still subjects of controversy. Finally, he describes the Syrian Church of Malabar, an institution of much interest to students of the history of Christianity. On all these varied races the author has collected a mass of valuable information. This book, for which anthropologists are indebted to the liberality of the State Government, is excellently produced, and supplied with admirable photographic illustrations. Thanks to the writer and Mr. Edgar Thurston, the ethnologist is now provided with a trustworthy account of the races of southern India. The survey will be completed by a third volume devoted to physical anthropology, the appearance of which will be awaited with much interest.

(3) Lord Avebury's work on primitive civilisation, first issued in 1870, now ranks as an anthropological classic. It is, however, much to be regretted that the author, in this new edition, has been unable to subject the work to a thorough revision and bring his authorities up to date. It is true that in his introduction he refers to some recent work, and discusses with admirable restraint the vivacious criticisms of the late Mr. Andrew Lang on the views expressed on savage religion; but, frankly speaking, his bibliography and references are not up to the level of modern research. A list of authorities on the beliefs and sociology of primitive man which ignores Sir E. Tylor's "Primitive Culture," and writers like Profs. Frazer and Westermarck, Messrs. Crawley, Hartland, and Lang, is clearly inadequate, and the authorities quoted in the notes, though good of their kind, are prehistoric, because they do not include recent surveys of savage life in Australia, India, America, Africa, or Melanesia. It may be hoped that in the next edition of this useful book Lord Avebury will take the opportunity of subjecting it to thorough revision, by bringing the bibliography up to date, and improving the notes by quotations from the works of modern travellers and ethnologists.

(4) The "Notes and Queries on Anthropology," issued by the Royal Anthropological Institute with the aid of a grant from the British Association, now appears in a thoroughly revised edition, prepared under the superintendence of Miss Freire-Marreco and Prof. J. L. Myres. Every chapter of the work bears the marks of careful and judicious reconsideration, and, as it stands, it should be in the hands of every traveller and official who has the chance of investigating savage races. In future editions of this valuable *questionnaire*, it might be advisable to extend the list of works recommended to the student, which only very imperfectly represents the best modern work. A section might also be added suggesting the precautions under which these elaborate interrogatories should be used in field work, with a suggestion, gathered from the experience of those familiar with savage races, of the best methods by which trustworthy information can be collected.

(5) The question of the origin of megalithic monuments and of the race by whom they were constructed has acquired fresh importance from the discussion, at the recent meeting of the British Association at Dundee, of the theories advanced by Prof. G. Elliot Smith, who attributes them to influence from Egypt, where he assumes that the invention of copper led to the use of carved stone. Mr. Peet's method in the present book is to give a summary account of megalithic monuments throughout the world, to which he adds some cautious, well-considered speculations on their origin and diffusion. He fully recognises the difficulty, in the present state of our knowledge, of deciding the centre from which they were derived. He suggests that the idea of the rock-tomb was brought into the megalithic area by the builders of the monuments, that it did not result from contact with the eastern Mediterranean, and that there is no direct connection between the corridor tombs of the megalithic countries and the great Tholoi of Crete and the Greek mainland. The book may be safely recommended as a cautious summary of a most difficult problem.

RECENT BOOKS ON PHYSICAL SUBJECTS.

(1) *Elements and Electrons.* By Sir W. Ramsay, K.C.B., F.R.S. Pp. ix+173. (London and New York: Harper and Brothers, 1912.) Price 2*s.* 6*d.* net. (Harper's Library of Living Thought.)

(2) *Radium and Radioactivity.* By A. T. Cameron. Pp. 185. (London: S.P.C.K., 1912.) Price 2*s.* 6*d.* (Romance of Science Series.)

(3) *A Handbook of Physics.* By W. H. White. Pp. xv+667. (London: Methuen and Co., Ltd., n.d.) Price 7*s.* 6*d.*

(4) *A Course of Physics, Practical and Theoretical.* By Dr. C. H. Draper. Pp. xi+413. (London: Blackie and Son, Ltd., 1912.) Price 4*s.* 6*d.* net.

(5) *La Théorie des Ions et l'Electrolyse.* Deuxième Édition. By A. Hollard. Pp. vii+220. (Paris: Gauthier-Villars, 1912.) Price 5 francs.

(6) *Lehrbuch der Optik.* Dritte erweiterte Auflage. By Dr. Paul Drude. Herausgegeben von Dr. E. Gehrcke. Pp. xvi+548. (Leipzig: S. Hirzel, 1912.) Price 12 marks.

(7) *Electricity and Its Practical Applications.* By Prof. M. Maclean. Pp. xiv+492. (London: Blackie and Son, Ltd., n.d.) Price 10*s.* 6*d.* net.

(1) IT need scarcely be stated that a popular treatise from the pen of Sir William Ramsay is sure to be of absorbing interest. This is particularly the case with the present volume, with the subject of which the author's name is so intimately associated. The various stages in the development of chemistry, and later of radioactivity, are sketched in a manner quite delightful, and although the treatment of the mechanics involved may be regarded by some as rather loose, it is only in a few instances that this objection can be raised, and it should be remembered that, after all, the readers will not all be strict mathematicians.

The principal chapters are those which deal with Dalton's atomic theory, molecular weights, the periodic table, molecules—invisible and visible—electrons, radioactivity and transmutation. Probably the last of these is that which will invoke the greatest interest. It is common knowledge that Sir William Ramsay's work in this field has been received in some quarters with scepticism, and, of course, all controversies are popular. The author draws a distinction between "transmutation" and "transformation," the former applying to controlled changes as distinct from natural changes. Among the reasons brought forward as indicating the probable effect of corpuscular bombardment in producing transmutation, it is suggested that it may be due to high temperature. The "temperature" of rapidly moving alpha particles is calculated upon the kinetic theory, and the number obtained is enormous.

With this view it is difficult to agree, for even if we admit the validity of this calculation as representing the temperature of the particles themselves, it cannot be claimed that it also measures the temperature of the body bombarded. But apart from this, the accumulated evidence of transmutation which is recorded in this chapter should not be lightly dismissed, especially coming as it does from the discoverer of the spontaneous production of helium from radium. It may be scarcely credible, because so extraordinary, but it may, nevertheless, be true.

(2) This is another little book on somewhat similar lines, although, in this case, radioactivity is the sole subject. The author takes the very reasonable view that some knowledge of physics and chemistry must be assumed in the reader, but the calls on this knowledge are neither great nor numerous, and will form no bar to the majority of students. A straightforward and interesting account of the main radioactive phenomena constitutes the contents of the book, and the novice who desires some acquaintance with this wonderful new subject could not do better than acquire a copy.

(3) It is not often that one comes across a textbook exhibiting so much originality as that which Mr. White has recently produced. To say that